

REMARKS/ARGUMENTS

In the most recent Office Action, claims 2-17 were pending. Claims 2-3 and 11-12 are withdrawn from consideration. Claims 4-10 and 16-17 are allowed. Claims 13-15 are rejected. In response, claims 4, 8 and 13-14 are amended and claims 2-3, 11-12 and 15 are cancelled. Accordingly, claims 4-10, 13-14 and 16-17 are pending in the present application. No new matter is added.

Claim Rejections - 35 U.S.C. §112

The Office Action states that claim 13 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states that claim 13 is vague and indefinite because of ambiguity concerning references to a surface recited in the claim.

In response, Applicant has amended claim 13 to improve the clarity of the claim and identify the particular scope of the subject matter with a reasonable degree of certainty. Accordingly, Applicant respectfully submits that in the rejection of claim 13 under 35 U.S.C. §112, second paragraph, is overcome, and respectfully requests that it be reconsidered and withdrawn.

Claim Rejections -35 U.S.C. §103

The Office Action states that claims 13-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's admitted prior art in view of Taki (JP 02016510) and Konishi et al. (U.S. Patent No. 5,596,210). In particular, the Office Action states that claim 13 does not structurally distinguish over the applied prior art, and claims 14 and 15 are rejected for the same reasons as provided in the previous Office Action. Namely, the Office Action states that claims 14 and 15 "are obvious structure." In response to Applicant's arguments, the present Office Action states that the prior art teaches termination with an optical coupling agent having a refractive index of the appropriate index of refraction, citing the disclosure by Konishi et al.

Claim 15 is cancelled from the application, thereby rendering the rejection of that claim under 35 U.S.C. §103(a) moot. Applicant respectfully traverses the rejection of claims 13 and 14.

Applicant has amended claim 13 to more clearly recite the relationship between the various portions of the photodetector. In particular, the photodetector now recites:

said end surface including an abutting surface positioned below and spaced laterally from said light incident facet and said edge for receiving an optical waveguide to contribute to precisely positioning said optical waveguide.

Applicant submits that the abutting surface is well defined as positioned below and spaced laterally from the light incident facet and the edge at which the substrate top surface and end surface meet. The particular positioning of the abutting surface contributes to precise spacing of the end of the optical waveguide from the light incident facet so that improved responsiveness and performance can be obtained without other complicated and time consuming positioning procedures or techniques. The abutting surface achieves this advantage in the present invention, and is not shown in Applicant's admitted prior art or in the disclosures by Taki or Konishi et al., either taken alone or in combination. Accordingly, because claim 13 recites an element that is disclosed nowhere in the cited prior art references, claim 13 should be patentable over those prior art references. Applicant therefore respectfully submits that the rejection of claim 13 under 35 U.S.C. §103(a) is overcome, and respectfully requests that it be reconsidered and withdrawn.

Claim 14 recites a number of elements that the cited prior art references do not disclose, including:

an upper layer over said photo-absorption layer in said photo absorption part being terminated with a substance having a smaller refractive index than a semiconductor layer;

wherein incident light is refracted at said light incident facet and transit said photo-absorption layer at an angle with respect to an orthogonal of said photo-absorption layer such that said transit

light is totally reflected by said smaller refractive index substance terminating said upper layer.

The particular combination of an upper layer over the photo-absorption layer having a smaller refractive index than a semiconductor layer with the angle at which refracted light transits the photo-absorption layer produces total reflection of the transmitting refracted light at the upper layer. In addition, the upper layer is positioned in the optical path after the light receiving element, rather than before.

The Office Action states that the prior art teaches an optical coupling agent with an appropriate index of refraction. However, the cited prior art of Konishi et al. shows an optical coupling agent used to couple a light guide and a light receiving portion of a semiconductor substrate, i.e., the optical coupling agent transmits light to the light receiver rather than reflects light after reception. Accordingly, the cited prior art references not only fail to teach the combination recited in claim 14, but indeed actually teach away from the present invention by specifically calling for an optical coupling agent that transmits light, rather than contributing to complete light reflection, and located in the optical path before the light receiver. By forming the present invention according to the recitations in claim 14, the photo-absorption layer can be constructed much thinner than was formerly possible, thereby improving device responsiveness and speed performance. Because Applicant has demonstrated that claim 14 recites elements not shown in any of the cited prior art references, either alone or in combination, the rejection of claim 14 under 35 U.S.C. §103(a) should be overcome. Accordingly, Applicant respectfully requests that the rejection of claim 14 be reconsidered and withdrawn.

Conclusion

Applicant believes that the present submission is a complete response to issues raised in the previous Office Action. Applicant respectfully believes that in view of the above amendments and discussion, the application is now in condition for allowance, and earnestly solicits notice to that effect. If it is believed that an interview would contribute to resolving any

issues prior to allowance, the Examiner is requested to contact the undersigned counsel at the number provided below.

EXPRESS MAIL CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail to Addressee (mail label # EV342531820US) in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, Alexandria, VA 22313-1450, on September 17, 2003

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Respectfully submitted,

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